

HUDWALKER & ASSOCIATES, INC

Consulting Engineers
505 Potosi St
PO Box 676
Farmington Missouri 63640
(314) 756 6775

Site	Big River Mine
ID #	MO981126899
Break	13
Other	21E
	7-10-89

OZCR

July 10, 1989

Mrs Janese Neher
Department of Natural Resources
Waste Management Program
P O Box 176
Jefferson City, MO 65102

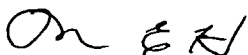
Re St Francois County Landfill

Dear Mrs Neher

Enclosed are the results of the annual sampling and testing of the groundwater monitoring wells at the St Francois County landfill. Of the six wells, only four had groundwater available to sample.

All sampling and testing was performed by Larron Laboratories of Cape Girardeau, Missouri. Should you have questions regarding these results, please feel free to contact the laboratory directly. Samples were collected May 11, 1989.

Sincerely,



Marvin E Hudwalker

mh

Enclosures

cc Mr Gayle Blackwell
Mr Bob Oberfelt ✓
Mr C G Mattsson
Mr John Carter
Mr Rick Roberts, DNR

40108318



SUPERFUND RECORDS

ANNUAL WASTE MANAGEMENT - WATER MONITORING REPORT

FACILITY: ST FRANCOIS COUNTY SANITARY LANDFILL
 PERMIT NO: 118701
 POINT NO: 101

FORWARD TO: DEPARTMENT OF NATURAL RESOURCES
 WASTE MANAGEMENT-ENFORCEMENT SECTION
 P O BOX 176
 JEFFERSON CITY MO 65102

DATE RECD BY LAB: 5-11-89
 SAMPLES RECD PROPERLY PRESERVED: ☒ N (CIRCLE ONE)
 SAMPLES ANALYZED w HOLD 13 T MC ☒ C (CIRCLE ONE)
 LAB NAME: Larron Laboratory
 LAB ADDRESS: 529 Broadway
 Cape Girardeau, MO 63701
 LAB TELEPHONE: 314 334-8910
 LAB SUPERVISOR'S SIGNATURE: John Shulman

NOTES QL MEANS THE REASONABLY ACCEPTABLE QUANTITATIVE LIMIT FOR EACH PARAMETER IN THE SPECIFIED UNITS FOR LOWER VALUES PLACE A LESS THAN SIGN (<) IN FRONT OF VALUES
 FILTER AT TIME SAMPLES ARE COLLECTED FOR ALL HEAVY METALS, MERCURY AND TDS

UNITS - MG/L

NH3 (AMMONIA AS N) QL=1 0.03
 NO32 (NITRATE/NITRITE AS N) QL=0.1 3.77
 P (TOTAL P) QL=0.05 3.21
 COD (CHEMICAL OXYGEN DEMAND) QL=5 48.6
 CL (CHLORIDE) QL=1 1.6
 TDS (TOTAL DISSOLVED SOLIDS) QL=1 681.5
 FL (FLUORIDE) QL=1 1.344
 SO4 (SULFATE) QL=1 2329
 CA (CALCIUM) QL=5 159
 MG (MAGNESIUM) QL=5 47
 NA (SODIUM) QL=5 18
 HARD (HARDNESS) CALCULATED 590.6
 TOC (TOTAL ORGANIC CARBON) QL=1

UNITS - UG/L

AG (SILVER) QL=10 120
 AS (ARSENIC) QL=10 20
 B (BORON) QL=100 120
 BA (BARIUM) QL=200 37
 CD (CADMIUM) QL=5 120
 CO (COBALT) QL=50 120
 CR (CHROMIUM) QL=10 120
 CU (COPPER) QL=25 120
 FE (IRON) QL=100 120
 HG (MERCURY) QL=0.2 102
 MN (MANGANESE) QL=15 260
 PB (LEAD) QL=5 120
 SE (SELENIUM) QL=5 15
 ZN (ZINC) QL=20 160
 TOX (TOTAL ORGANIC HALOGEN) QL=5

COND (CONDUCTIVITY) AT 25 C UMHO/CM 1031
 PH (UNITS) 7.7

ELEVATION OF REFERENCE POINT WATER LEVEL (DEPTH FROM REFERENCE POINT TO WATER) FT TOTAL DEPTH OF WELL (DISTANCE FROM REFERENCE POINT TO BOTTOM OF WELL) FT 12

WELL RECHARGES WITHIN 24 HRS YES NO
 RECHARGES TOO SLOWLY TO SAMPLE: YES NO
 WELL VOLUMES REMOVED 2

PURGING PARAMETERS STABILIZED: ☒ YES ☐ NOSAMPLE COLLECTED BY: BAILER PUMP OTHER (CIRCLE ONE)TYPE OF SAMPLE: WELL WITHOUT PUMP WELL WITH PUMP SURFACE SAMPLE (CIRCLE ONE)

COLLECTOR'S COMMENTS

DATE COLLECTED: 5-11-89
 COLLECTED BY: LANDFILL LAB (CIRCLE ONE)
 COLLECTOR'S NAME: John Shulman
 METALS FIELD FILTERED: ☒ YES ☐ NO
 CHAIN OF CUSTODY WITH EACH SAMPLE: ☒ YES ☐ NO

ANNUAL WASTE MANAGEMENT - WATER MONITORING REPORT

FACILITY: ST FRANCOIS COUNTY SANITARY LANDFILL
 PERMIT NO: 118701
 POINT NO 102

FORWARD TO: DEPARTMENT OF NATURAL RESOURCES
 WASTE MANAGEMENT - ENFORCEMENT SECTION
 P O BOX 176
 JEFFERSON CITY, MO 65102

DATE RECD BY LAB 5-11-89
 SAMPLES RECD PROPERLY PRESERVED ☒ CIRCLE ONE
 SAMPLES ANALYZED W/IN HOLDING TIME: ☒ N (CIRCLE ONE)
 LAB NAME Larson Laboratory
 LAB ADDRESS 29 Broadway

NOTES - QL MEANS THE REASONABLY ACCEPTABLE QUANTITATIVE LIMIT FOR EACH PARAMETER IN THE SPECIFIED
 UNITS FOR LOWER VALUES PLACE A LESS THAN SIGN (<) IN FRONT OF VALUES
 FILTER AT TIME SAMPLES ARE COLLECTED FOR ALL HEAVY METALS MERCURY AND TDS

LAB TELEPHONE 314 334 8910
 LAB SUPERVISOR'S SIGNATURE John Sheddick

UNITS - MG/L

NH3 (AMMONIA AS N) QL=1 _____
 NO32 (NITRATE/NITRITE AS N) QL=0.1 _____
 P (TOTAL P) QL=0.05 _____
 COD (CHEMICAL OXYGEN DEMAND) QL=5 _____
 CL (CHLORIDE) QL=1 _____
 TDS (TOTAL DISSOLVED SOLIDS) QL=1 _____
 FL (FLUORIDE) QL=1 _____
 SO4 (SULFATE) QL=1 _____
 CA (CALCIUM) QL=5 _____
 MG (MAGNESIUM) QL=5 _____
 NA (SODIUM) QL=5 _____
 HARD (HARDNESS) CALCULATED _____
 TOC (TOTAL ORGANIC CARBON) QL=1 _____

UNITS - UG/L

AG (SILVER) QL=10 _____
 AS (ARSENIC) QL=10 _____
 B (BORON) QL=100 _____
 BA (BARIUM) QL=200 _____
 CD (CADMIUM) QL=5 _____
 CO (COBALT) QL=50 _____
 CR (CHROMIUM) QL=10 _____
 CU (COPPER) QL=25 _____
 FE (IRON) QL=100 _____
 HG (MERCURY) QL=0.2 _____
 MN (MANGANESE) QL=15 _____
 PB (LEAD) QL=5 _____
 SE (SELENIUM) QL=5 _____
 ZN (ZINC) QL=20 _____
 TOX (TOTAL ORGANIC HALOGEN) QL=5 _____

COND (CONDUCTIVITY) AT 25 C UMHO/CM _____

PH (UNITS) _____

WELL RECHARGES WITHIN 24 HRS: YES NO
 RECHARGES TOO SLOWLY TO SAMPLE: ☒ YES NO
 WELL VOLUMES REMOVED _____

PURGING PARAMETERS STABILIZED: YES NO

SAMPLE COLLECTED BY: BAILER PUMP OTHER (CIRCLE ONE)

TYPE OF SAMPLE: WELL WITHOUT PUMP WELL WITH PUMP SURFACE SAMPLE (CIRCLE ONE)

COLLECTOR'S COMMENTS dry

ELEVATION OF REFERENCE POINT _____

WATER LEVEL (DEPTH FROM REFERENCE POINT TO WATER) FT _____

TOTAL DEPTH OF WELL (DISTANCE FROM REFERENCE POINT TO BOTTOM OF WELL) FT _____

DATE COLLECTED: 5-11-89
 COLLECTED BY: LAB (CIRCLE ONE)
 COLLECTOR'S NAME John Sheddick
 METALS FIELD FILTERED: YES NO
 CHAIN OF CUSTODY WITH EACH SAMPLE: ☒ YES NO

ANNUAL WASTE MANAGEMENT-WATER MONITORING REPORT

FACILITY: ST FRANCOIS COUNTY SANITARY LANDFILL
 PDEM T NO: 1187A1
 POINT NO: 104
 PLEASE FORWARD TO: DEPARTMENT OF NATURAL RESOURCES
 WASTE MANAGEMENT-ENFORCEMENT SECTION
 P O BOX 176
 JEFFERSON CITY MO 65102

DATE RECD BY LAB: 5-11-89
 SAMPLES RECD PROPERLY PRESERVED: ☒ N (CIRCLE ONE)
 SAMPLES ANALYZED W/IN HOLDING TIME ☒ N (CIRCLE ONE)
 LAB NAME: Larron Labors, Inc.
 LAB ADDRESS: 570 Broadway
 Cape Girardeau, MO 65701

NOTES - QL MEANS THE REASONABLY ACCEPTABLE QUANTITATIVE LIMIT FOR EACH PARAMETER IN THE SPECIFIED
 UNITS FOR LOWER VALUES PLACE A LESS THAN SIGN (<) IN FRONT OF VALUES
 FILTER AT TIME SAMPLES ARE COLLECTED FOR ALL HEAVY METALS MERCURY AND TDS

LAB TELEPHONE: 314-334-8910
 LAB SUPERVISOR'S SIGNATURE: John Shadish

UNITS - MG/L

NH3 (AMMONIA AS N) QL=1 17
 NO32 (NITRATE/NITRITE AS N) QL=0.1
 P (TOTAL P) QL=0.05
 COD (CHEMICAL OXYGEN DEMAND) QL=5 80.3
 CL (CHLORIDE) QL=1 10.8
 TDS (TOTAL DISSOLVED SOLIDS) QL=1 922.5
 FL (FLUORIDE) QL=1 1791
 SO4 (SULFATE) QL=1 1251
 CA (CALCIUM) QL=5 252
 MG (MAGNESIUM) QL=5 73
 NA (SODIUM) QL=5 29
 HARD (HARDNESS) CALCULATED 929.9
 TOC (TOTAL ORGANIC CARBON) QL=1

UNITS - UG/L

AG (SILVER) QL=10 <20
 AS (ARSENIC) QL=10
 B (BORON) QL=100
 BA (BARIUM) QL=200
 CD (CADMIUM) QL=5 <20
 CO (COBALT) QL=50 120
 CR (CHROMIUM) QL=10 40
 CU (COPPER) QL=25 30
 FE (IRON) QL=100 23
 HG (MERCURY) QL=0.2
 MN (MANGANESE) QL=15 500
 PB (LEAD) QL=5 <20
 SE (SELENIUM) QL=5
 ZN (ZINC) QL=20 70,000
 TOX (TOTAL ORGANIC HALOGEN) QL=5

COND (CONDUCTIVITY) AT 25 C UMHO/CM 193
 PH (UNITS) 6.9

ELEVATION OF REFERENCE POINT
 WATER LEVEL (DEPTH FROM REFERENCE POINT TO WATER) FT

WELL RECHARGES WITHIN 24 HRS: YES ☒ NO
 RECHARGES TOO SLOWLY TO SAMPLE: YES ☒ NO
 WELL VOLUMES REMOVED
 PURGING PARAMETERS STABILIZED ☒ YES NO
 SAMPLE COLLECTED BY BATTLER PUMP OTHER (CIRCLE ONE)
 TYPE OF SAMPLE WELL WITHOUT PUMP WELL WITH PUMP SURFACE SAMPLE (CIRCLE ONE)

TOTAL DEPTH OF WELL (DISTANCE FROM REFERENCE POINT TO BOTTOM OF WELL) FT

COLLECTOR'S COMMENTS: Insufficient volume in well to run all requirements. DNR on-site at the time

DATE COLLECTED: 5-11-89
 COLLECTED BY: LANDFILL ☒ LAB (CIRCLE ONE)
 COLLECTOR'S NAME: John Shadish
 METALS FIELD FILTERED ☒ YES NO
 CHAIN OF CUSTODY WITH EACH SAMPLE ☒ YES NO

ANNUAL WASTE MANAGEMENT-WATER MONITORING REPORT

FACILITY: ST FRANCOIS COUNTY SANITARY LANDFILL
 PERMIT NO 118701
 POINT NO 105
 DEPARTMENT OF NATURAL RESOURCES
 WASTE MANAGEMENT-ENFORCEMENT SECTION
 P O BOX 176
 JEFFERSON CITY MO 65102

DATE RECD BY LAB: 5-11-89
 SAMPLES RECD PROPERLY PRESERVED ☒ N (CIRCLE ONE)
 SAMPLES ANALYZED W/IN HOLDING TIME ☒ N (CIRCLE ONE)
 LAB NAME: Lorton Laboratory
 LAB ADDRESS: 529 Broadway
 Cape Girardeau, MO 63701
 LAB TELEPHONE: 314 334 8910
 LAB SUPERVISOR'S SIGNATURE: *John Shadoff*

NOTES - QL MEANS THE REASONABLY ACCEPTABLE QUANTITATIVE LIMIT FOR EACH PARAMETER IN THE SPECIFIED
 UNITS FOR LOWER VALUES PLACE A LESS THAN SIGN (<) IN FRONT OF VALUES
 FILTER AT TIME SAMPLES ARE COLLECTED FOR ALL HEAVY METALS MERCURY AND TDS

UNITS - MG/L

NH3 (AMMONIA AS N) QL=1 _____
 NO32 (NITRATE/NITRITE AS N) QL=0.1 _____
 P (TOTAL P) QL=0.05 _____
 COD (CHEMICAL OXYGEN DEMAND) QL=5 _____
 CL (CHLORIDE) QL=1 _____
 TDS (TOTAL DISSOLVED SOLIDS) QL=1 _____
 FL (FLUORIDE) QL=1 _____
 SO4 (SULFATE) QL=1 _____
 CA (CALCIUM) QL=5 _____
 MG (MAGNESIUM) QL=5 _____
 NA (SODIUM) QL=5 _____
 HARD (HARDNESS) CALCULATED _____
 TOC (TOTAL ORGANIC CARBON) QL=1 _____

UNITS - UG/L

AG (SILVER) QL=10 _____
 AS (ARSENIC) QL=10 _____
 B (BORON) QL=100 _____
 BA (BARIUM) QL=200 _____
 CD (CADMIUM) QL=5 _____
 CO (COBALT) QL=50 _____
 CR (CHROMIUM) QL=10 _____
 CU (COPPER) QL=25 _____
 FE (IRON) QL=100 _____
 HG (MERCURY) QL=0.2 _____
 MN (MANGANESE) QL=15 _____
 PB (LEAD) QL=5 _____
 SE (SELENIUM) QL=5 _____
 ZN (ZINC) QL=20 _____
 TOX (TOTAL ORGANIC HALOGEN) QL=5 _____

COND (CONDUCTIVITY) AT 25 C UMHO/CM _____
 PH (UNITS) _____

ELEVATION OF REFERENCE POINT _____
 WATER LEVEL (DEPTH FROM REFERENCE POINT TO WATER) FT _____

WELL RECHARGES WITHIN 24 HRS YES NO
 RECHARGES TOO SLOWLY TO SAMPLE YES NO
 WELL VOLUMES REMOVED _____

TOTAL DEPTH OF WELL (DISTANCE FROM REFERENCE POINT TO BOTTOM OF WELL) FT _____

PURGING PARAMETERS STABILIZED: YES NO

SAMPLE COLLECTED BY: BAILED PUMP OTHER (CIRCLE ONE)

TYPE OF SAMPLE: WELL WITHOUT PUMP WELL WITH PUMP SURFACE SAMPLE (CIRCLE ONE)

COLLECTOR'S COMMENTS: Dry

DATE COLLECTED: 5-11-89
 COLLECTED BY: LAB (CIRCLE ONE)
 COLLECTOR'S NAME: W. H. H. H.
 METALS FIELD FILTERED: YES NO
 CHAIN OF CUSTODY WITH EACH SAMPLE: YES NO

ANNUAL WASTE MANAGEMENT-WATER MONITORING REPORT

FACILITY: ST FRANCOIS COUNTY SANITARY LANDFILL
 PERMIT NO: 118701
 POINT NO: 103

PLEASE FORWARD TO: DEPARTMENT OF NATURAL RESOURCES
 WASTE MANAGEMENT-ENFORCEMENT SECTION
 P O BOX 176
 JEFFERSON CITY MO 65102

DATE RECD BY LAB: 5-11-89
 SAMPLER RECD PROPERLY PRESERVED ☒ N (CIRCLE ONE)
 SAMPLES ANALYZED W/IN HOLDING TIME: ☒ N (CIRCLE ONE)
 LAB NAME: Lorrain Laboratory
 LAB ADDRESS: 2 Broadway
 Lab C, Jersey MO 63701
 LAB TELEPHONE: 314-334-8910
 LAB SUPERVISOR'S SIGNATURE: John Shadwick

NOTES - QL MEANS THE REASONABLY ACCEPTABLE QUANTITATIVE LIMIT FOR EACH PARAMETER IN THE SPECIFIED
 UNITS FOR LOWER VALUES PLACE A LESS THAN SIGN (<) IN FRONT OF VALUES
 FILTER AT TIME SAMPLES ARE COLLECTED FOR ALL HEAVY METALS MERCURY AND TDS

UNITS - MG/L

NH3 (AMMONIA AS N) QL=1 0.34
 NO32 (NITRATE/NITRITE AS N) QL=0.1 5.83
 P (TOTAL P) QL=0.05 4.12
 COD (CHEMICAL OXYGEN DEMAND) QL=5 22.2
 CL (CHLORIDE) QL=1 2.1
 TDS (TOTAL DISSOLVED SOLIDS) QL=1 1309.5
 FL (FLUORIDE) QL=1 1.348
 SO4 (SULFATE) QL=1 3165
 CA (CALCIUM) QL=5 285
 MG (MAGNESIUM) QL=5 75
 NA (SODIUM) QL=5 0.57
 HARD (HARDNESS) CALCULATED 1020.5
 TOC (TOTAL ORGANIC CARBON) QL=1 /

UNITS - UG/L

AG (SILVER) QL=10 <20
 AS (ARSENIC) QL=10 18
 B (BORON) QL=100 140
 BA (BARIUM) QL=200 52
 CD (CADMIUM) QL=5 <20
 CO (COBALT) QL=50 30
 CR (CHROMIUM) QL=10 <20
 CU (COPPER) QL=25 <20
 FE (IRON) QL=100 70
 HG (MERCURY) QL=0.2 <0.2
 MN (MANGANESE) QL=15 140
 PB (LEAD) QL=5 <20
 SE (SELENIUM) QL=5 <5
 ZN (ZINC) QL=20 40
 TOX (TOTAL ORGANIC HALOGEN) QL=5 /

COND (CONDUCTIVITY) AT 25 C UMHO/CM 1432
 PH (UNITS) 6.97

ELEVATION OF REFERENCE POINT _____
 WATER LEVEL (DEPTH FROM REFERENCE POINT TO WATER) FT _____

WELL RECHARGES WITHIN 24 HRS: YES NO
 RECHARGES TOO SLOWLY TO SAMPLE: YES ☒ NO
 WELL VOLUMES REMOVED 2
 PURGING PARAMETERS STABILIZED: ☒ YES NO
 SAMPLE COLLECTED BY: WELLER PUMP OTHER (CIRCLE ONE)
 TYPE OF SAMPLE: WELL WITHOUT PUMP WELL WITH PUMP SURFACE SAMPLE (CIRCLE ONE)

COLLECTOR'S COMMENTS _____

DATE COLLECTED 5-11-89
 COLLECTED BY LANDFILL ☒ LAB (CIRCLE ONE)
 COLLECTOR'S NAME John A. Hines
 METALS FIELD FILTERED: ☒ YES NO
 CHAIN OF CUSTODY WITH EACH SAMPLE: ☒ YES NO

TOTAL DEPTH OF WELL (DISTANCE FROM REFERENCE POINT TO BOTTOM OF WELL) FT 6.6

ANNUAL WASTE MANAGEMENT-WATER MONITORING REPORT

FACILITY ST FRANCOIS COUNTY SANITARY LANDFILL
 PERMIT NO 11A701
 POINT NO: 106
 DEPARTMENT OF NATURAL RESOURCES
 WASTE MANAGEMENT-ENFORCEMENT SECT C
 P O BOX 176
 JEFFERSON CITY MO 65102

DATE RECD BY LAB: 5-11-89
 SAMPLES RECD PROPERLY RESERVED ☒ N (CIRCLE ONE)
 SAMPLES ANALYZED W/IN HOLDING TIME: ☒ N (CIRCLE ONE)
 LAB NAME: Lanco Laboratory
 LAB ADDRESS: 23 Broadway
 Lab Girard, MO 63701
 LAB TELEPHONE: 314 334-8910
 LAB SUPERVISOR'S SIGNATURE: John Shulz

NOTES - QL MEANS THE REASONABLY ACCEPTABLE QUANTITATIVE LIMIT FOR EACH PARAMETER IN THE SPECIFIED
 UNITS FOR LOWER VALUES PLACE A LESS THAN SIGN (<) IN FRONT OF VALUES
 FILTER AT TIME SAMPLES ARE COLLECTED FOR ALL HEAVY METALS MERCURY AND TDS

UNITS - MG/L

NH3 (AMMONIA AS N) QL=1 0.06
 NO32 (NITRATE/NITRITE AS N) QL=0.1 5.88
 P (TOTAL P) QL=0.05 3.23
 COD (CHEMICAL OXYGEN DEMAND) QL=5 56.3
 CL (CHLORIDE) QL=1 124.2
 TDS (TOTAL DISSOLVED SOLIDS) QL=1 1068.0
 FL (FLUORIDE) QL=1 149.0
 SO4 (SULFATE) QL=1 785.4
 CA (CALCIUM) QL=5 245
 MG (MAGNESIUM) QL=5 52
 NA (SODIUM) QL=5 49.7
 HARD (HARDNESS) CALCULATED 825.9
 TOC (TOTAL ORGANIC CARBON) QL=1

UNITS - UG/L

AG (SILVER) QL=10 220
 AS (ARSENIC) QL=10 7
 B (BORON) QL=100 1
 BA (BARIUM) QL=200 371
 CD (CADMIUM) QL=5 420
 CO (COBALT) QL=50 420
 CR (CHROMIUM) QL=10 420
 CU (COPPER) QL=25 420
 FE (IRON) QL=100 3400
 HG (MERCURY) QL=0.2 40.2
 MN (MANGANESE) QL=15 160
 PB (LEAD) QL=5 420
 SE (SELENIUM) QL=5 45
 ZN (ZINC) QL=20 710
 TOX (TOTAL ORGANIC HALOGEN) QL=5

COND (CONDUCTIVITY) AT 25 C UMHO/CM 1645
 PH (UNITS) 6.8

ELEVATION OF REFERENCE POINT
 WATER LEVEL (DEPTH FROM REFERENCE POINT TO WATER) FT

WELL RECHARGES WITHIN 24 HRS: YES NO
 RECHARGES TOO SLOWLY TO SAMPLE: YES NO
 WELL VOLUMES REMOVED 2
 PURGING PARAMETERS STABILIZED: YES NO
 SAMPLE COLLECTED BY: BAILER PUMP OTHER (CIRCLE ONE)
 TYPE OF SAMPLE: WELL WITHOUT PUMP WELL WITH PUMP SURFACE SAMPLE (CIRCLE ONE)

TOTAL DEPTH OF WELL (DISTANCE FROM REFERENCE POINT TO BOTTOM OF WELL) FT 6.3

COLLECTOR'S COMMENTS: insufficient volume to run Boron

DATE COLLECTED 5-11-89
 COLLECTED BY LANDFILL LAB (CIRCLE ONE)
 COLLECTOR'S NAME: J. Shulz
 METALS FIELD FILTERED YES NO
 CHAIN OF CUSTODY WITH EACH SAMPLE YES NO